## *Report on the Measurement of an Arc of Meridian in Uganda.*

By Col. C. F. Close, R.E.

[At their meeting on 1907 April 12 the Council voted the sum of £50 as a small contribution from the funds of the Society towards the cost of measuring a section of the great African arc of meridian on the Uganda-Congo boundary. The Council have now much pleasure in publishing to the Society the annexed short preliminary report from Col. C. F. Close, announcing the successful completion of the work.]

1. The measurement was commenced in March 1908 and completed in February 1909. The arc extends from 1° 10′ N. to 1° 10′ S., *i.e.* the length is $2\frac{1}{3}$ degrees, or about 165 miles.

2. One base, length 11 miles, was measured in the northern portion, in the Semliki Valley. The chain consists of 1 complex figure, 3 quadrilaterals, and 1 tetragon.

3. All the stations have been marked in a permanent manner, and the Government of Uganda has been notified of their positions.

4. The probable error of an observed angle is about 0″·4.

5. Three azimuths and 14 latitudes were observed.

6. Magnetic observations for declination and dip were made at twenty stations.

7. The work was organised by Major Bright, C.M.G., and carried out by a British party consisting of Captain Jack, R.E., Mr. McCaw, Mr. C. Chevallier, L.-Cpl. Jones, R.E., L.-Cpl. Page, R.E.; and for a portion of the time, Captain S. Iredell, 4th Battalion, King's African Rifles, who also commanded the escort.

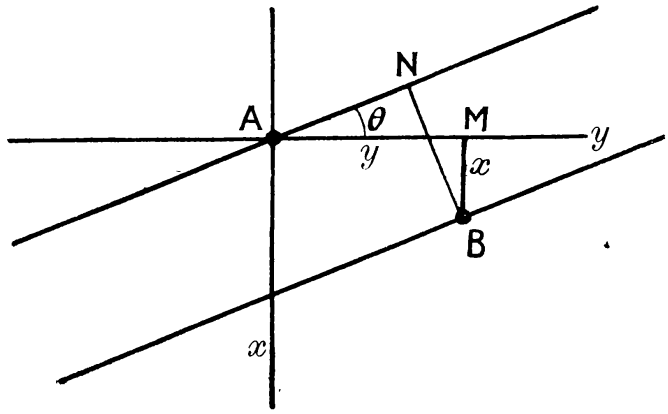
The Belgian party consisted of Captain Wangermée and Dr. M. Dehalu.

1909 *June* 1.

## *A Method of Double-Star Measurement.* By J. B. Dale, M.A.

1. The method of double-star measurement in general use consists of a direct determination of the polar coordinates of one of the stars relative to the other. The operations involved are, theoretically at any rate, very simple, but the comparison of the same observer's observations made on different occasions, or of the observations of different observers, reveals the existence of well-defined systematic errors both in distance and position angle. The cause of these errors is somewhat obscure, and their elimination is difficult and uncertain.

It is, however, a well-established principle that the best method of eliminating systematic error of any sort is to vary as far as possible the conditions of measurement, and the object of the following note is to suggest a method of measurement in which such variation is made. It is possible that results obtained in this way may serve as a check upon the results obtained by the ordinary method of procedure, and may throw some light on the source and character of the errors involved.




2. In the figure, A and B represent two stars whose relative position is to be determined. Take A as an origin of rectangular coordinates, the positive direction of the $x$ axis being drawn towards the north and the $y$ axis being the parallel. Then $(x, y)$ being the coordinates of B, the distance of B from a line drawn through A making a positive angle $\theta$ with A$y$ is

$$x\cos\theta + y\sin\theta = \mathrm{BN}.$$

This distance may be measured in the usual way with the micrometer, one wire A′ being set on A and the other B′ on B.

If $a$ is the reading of B′ when it coincides with A′, then the reading when on B is

$$z = x\cos\theta + y\sin\theta + a.$$

Theoretically, the three unknowns $x$, $y$, $a$ can be found from measurements made with three different values of $\theta$, but of course it is preferable to increase the number of settings and deduce the